

Claims

1. A method of treating a surface for the removal of a surface portion comprising the step of irradiating the surface with laser light, characterised in that the irradiation is effected by covering said surface in a plurality of discrete spots of laser light having an average power density per spot of up to 200 W/cm^2 .
2. A method of treating a surface according to claim 1 wherein the spots of laser light overlap.
3. A method of treating a surface according to either claim 1 or claim 2 wherein said plurality of spots of laser light are arranged in a geometric arrangement defined by the locations of centres of the spots of laser light.
4. A method of treating a surface according to claim 3 wherein the geometric arrangement of a plurality of spots of laser light is that of a simple geometric figure.
5. A method of treating a surface according to claim 4 wherein the simple geometric figure is chosen from the group consisting of triangles, rectangles, rhombi, pentagons, and hexagons.
6. A method of treating a surface according to claim 5 wherein the simple geometric figure is an equilateral triangle.

7. A method of treating a surface according to any one of claims 4, 5 or 6 wherein the simple geometric figures are tessellated.
- 5 8. A method of treating a surface according to any one of claim 2 to 7 wherein the extent of overlap of overlapping spots of laser light are such that no area not, at one time during use of the method, exposed to laser light is present between the locations of the
10 spots of laser light.
9. A method of treating a surface according to any previous claim wherein the spot of laser light is circular.
- 15 10. A method of treating a surface according to claim 9 wherein a distance between the centres of the spots of laser light is in the range $4/7$ to $6/7$ of the diameter, above a threshold power density level for
20 scabbling, of the circular spot of laser light.
11. A method of treating a surface according to any previous claim wherein the spots of laser light are defined as an area of laser light incident upon a
25 surface, wherein the area of laser light is that area above a threshold power density level for causing scabbling.
12. A method of treating a surface according to any
30 previous claim wherein the incident laser light has an incident power density range of $30\text{W}/\text{cm}^2$ to $200\text{W}/\text{cm}^2$.

13. A method of treating a surface according to any previous claim wherein each spot of laser light irradiates the surface for a duration between 1s and 30s.
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14. A method of treating a surface according to any previous claim wherein the spots of laser light for use in the invention have an uneven power density across the beam.
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15. A method of treating a surface according to any previous claim wherein multiple arrays of spots of laser light are applied subsequent to one another to a surface to achieve a greater depth of surface removal by removing layers in a sequential manner.
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16. A method of treating a surface according to claim 15 wherein the location of spots of laser light of sequential arrays are placed at the interstices of previous arrays, so as to define a three dimensional matrix.
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17. A method according to any previous claim wherein the laser is an Yttrium Aluminium Garnet (YAG) laser, diode laser or fibre laser.
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18. A method according to any previous claim wherein the surface is a concrete surface.
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19. A method according to claim 18 wherein the surface is a cement or concrete surface contaminated with radionuclides.

20. A method according to any previous claim wherein the surface portion is removed by the effects of thermal shock.
- 5 21. A method of treating a surface for the removal of a surface portion substantially as hereinbefore described with reference to the accompanying description and any one of drawings 4, 5, 6 and 7.